

EXHIBIT A

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

SINGULAR COMPUTING LLC,)
)
Plaintiff) Civil Action
)
) No. 19-12551-FDS
vs.)
)
GOOGLE LLC,)
Defendant)

BEFORE: CHIEF JUDGE F. DENNIS SAYLOR, IV

MARKMAN HEARING CONDUCTED BY ZOOM

John Joseph Moakley United States Courthouse
1 Courthouse Way
Boston, MA 02210

March 31, 2021
9:00 a.m.

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1 So that leaves the only issue here on my argument is
2 whether to include memory and circuit, as we suggest, so the
3 issue has been paired down pretty good for us and for
4 everybody.

5 Now, the next slide, moving on, on the issue of
6 memory and circuit is this obviously comes from the patent,
7 and so we have to look to the patent to see what, if
8 anything, a processing element is because Google has already
9 conceded that, in fact, the execution unit is a processing
09:06AM 10 element.

11 So if we look to see, okay, if we know that, what is
12 it, and it says here for the purposes of discussion, we call
13 each unit, which pairs memory with the arithmetic a
14 processing element or PE.

15 And that's why we ask the Court to, when they
16 construe the term "execution unit" to be a processing
17 element, as Google concedes, that is paired with arithmetic,
18 which Google concedes, but it's also paired with memory, and,
19 clearly, I don't think Google is going to really argue, have
09:06AM 20 the hutzpah, so to speak, to argue that these things aren't
21 circuits.

22 As you can look at it, that's a circuit as you can
23 see in Fig. 4, and as you can see, the processing element,
24 Fig. 4 is the processing element.

25 Now, that's something I think you should note

1 because later on Google is somehow trying to confuse Fig. 4
2 and Fig. 6. Fig. 6 is the arithmetic element. The
3 processing element that we're all talking about is Fig. 4,
4 period, and the arithmetic unit, you can see it if you look
5 straight at it, and you see where it says 408. That's the
6 arithmetic unit, not the processing element, and it's clear
7 as a bell in the patents and the briefs and the rest, and I
8 think they agree that's the processing element for now.

9 Now, as you can see what this is doing in the
09:07AM 10 processing element, you add an arithmetic unit right there in
11 the middle, 408, and that's paired to a register, and a
12 register is a memory. There's no dispute about that, so
13 that's consistent in the intrinsic evidence, and it's
14 consistent, obviously, with what is described and we put in
15 the slide here in the patent, et cetera.

16 And as for the idea that's a circuit, I mean, our
17 position is you just look at it. Anyone skilled in the art
18 knows we're talking about a circuit here, and if you look
19 further in the patent, it says the physical implementation of
09:08AM 20 the PEA, that's a processing element array, e.g. chip could
21 be replicated, e.g. tiled on a circuit board.

22 Obviously, you have circuit boards, and you have
23 circuits on chips, and that's what we're talking about here,
24 so that's why we suggest basically that's the way to go.

25 Now, to briefly go through, first of all, Google

1 device includes memory locally accessible, so it's talking
2 about a local accessible memory. A local accessible memory
3 is not a memory. Obviously, memory is broader, and thus the
4 notion that the scope of 53 and 25 are the same is just
5 simply the argument factually is incorrect. It's also
6 legally, as we put in the brief, irrelevant anyways, but the
7 fact is what I want to point out is that the underlying
8 factor is incorrect on the claim.

9 The next one, their next argument they make is they
09:11AM 10 say not all embodiments in the patent have memory paired,
11 have a paired memory. They affirmatively say that. That
12 statement is false. Every embodiment in this patent has a
13 paired memory, period.

14 Now, what do they do in the brief and everywhere,
15 they say look at Fig. 6, and they say Fig. 6, there's no
16 memory paired to Fig. 6. True. Well, the point is -- well,
17 actually there is, but so what? Fig. 6 is not the execution
18 unit, Fig. 6 is not the processing element, Fig. 6 is the
19 arithmetic unit, and the claim is talking about an execution
09:12AM 20 unit, and that's what we're construing, so that argument just
21 simply isn't there, and, finally, even if it were, which it
22 isn't, that's the log down the bottom that obviously you
23 could have multiple embodiments, and each claim doesn't have
24 to cover every embodiment, so I think legally but, more
25 importantly, factually, the argument is just misstating given

1 "designed to perform arithmetic operations," adding that in,
2 "to execute a first operation," which is exactly not what the
3 claim says.

4 And, lastly, in rewriting the claim, it says
5 "designed to perform arithmetic operations on numerical
6 values," right? Well, the claim is talking about signals
7 specifically, and as you can see here, in no uncertain terms,
8 what they have done is changed like 80 percent of the words
9 of this phrase to take it all out of context, and then they
09:19AM 10 will gin up some type of non-infringement, and what they're
11 trying to do is when they say, "final result, designed to
12 perform arithmetic operations on numerical values," et
13 cetera, that's not what the processing element does.

14 The processing element processes a signal as
15 specifically claimed, and, most importantly, on this issue,
16 Judge, most importantly on this issue, and I think this is
17 the key, this is the same claim that Google represented to
18 the Patent Office, the PTAB, needs absolutely no
19 construction, plain and ordinary, and now as you can see from
09:20AM 20 this list of changes by Google, what they're trying to do is
21 rewrite the claim. This is rewriting the claim that they
22 presently represented needs no construction.

23 I think what they're doing, they should not be
24 allowed as a matter of law to do any of this because it just
25 doesn't make any sense whatsoever.

1 of his declaration, Dr. Khatri fails to cite any intrinsic
2 evidence on the number of required executions, so he can't
3 identify any guidance as to the number of repeated operations
4 necessary to satisfy the claim language.

5 If we could go to the next slide, please. Instead,
6 Dr. Khatri says you perform enough repeated executions until
7 the statistical mean is stable, and how many executions are
8 required to reach a stable statistical mean? Well, remember,
9 Dr. Khatri admits that in an analog system, performing the
10:01AM 10 same operation will produce different output values, and
11 initially a fluctuating average due to noise.

12 And I want to make clear in reference to the
13 question you asked earlier, your Honor, it's not the noise,
14 noise doesn't change or go away over time, it's just that it
15 averages out, the line flattens out, so Dr. Khatri says
16 initially you get a fluctuating average. He doesn't identify
17 the point where the average stops fluctuating, but he says at
18 some point, the average will stabilize, and it's at that
19 point you've performed enough repeated executions that you
10:02AM 20 could compare the new stable average to the results of an
21 exact mathematical calculation and determine whether a device
22 infringes the asserted claims, and the problem with
23 Dr. Khatri's interpretation, and he concedes this, is that
24 what he deems as stable a statistical average or what he
25 deems is a stable statistical mean is entirely subjective.

1 this execution.

2 THE COURT: And, again, we're probably spending too
3 much time on this point, but let's say that claim 53 covers
4 an abacus and it's a physical thing, and then claim 68 says
5 software that emulates an abacus. That doesn't necessarily
6 mean an abacus isn't a physical thing, it means you are
7 claiming an abacus and you are claiming software that
8 emulates an abacus, right? I don't see how those are
9 inconsistent.

10:27AM 10 MR. BHANSALI: Yes, your Honor. If it had claimed
11 an abacus, I think that would be the case, but I think the
12 difference here is they are just claiming the idea of a
13 low-precision high-dynamic range execution unit, and an
14 execution unit is not inherently hardware, it's just, I mean,
15 software is often referred to as having units, right, so, in
16 other words, this isn't a scenario where their term is itself
17 on its face limited to a physical device. It's actually
18 something that could be implemented in software, and they
19 have claims that are doing so, and the specification also
10:28AM 20 refers to having the execution unit embodied in software.

21 THE COURT: Okay.

22 MR. BHANSALI: Your Honor, if I could just read from
23 the spec., just, for example, the language here, they have,
24 "Moreover, generally, any of the techniques described above
25 may be implemented, for example, in hardware, software

1 you think that you need more time than the time you have
2 remaining, you can say so. One advantage of Zoom as opposed
3 to getting on an airplane from San Francisco, it's not
4 terribly inconvenient for us to continue this hearing. Today
5 doesn't work, but, you know, either later this week or maybe
6 spilling into next week.

7 MR. HAYES: I think, Judge, I can wrap it up pretty
8 quickly.

9 THE COURT: All right, Mr. Hayes.

11:06AM 10 MR. HAYES: To start off, anyways, to start off a
11 little bit where my Brother left off, we've got a lot to go
12 over, but he keeps saying that he's not trying to read out
13 the term, "signal." That is absolutely incorrect. The claim
14 says, "A first operation on a first input signal,
15 representing a first numerical value."

16 In his construction, if you adopt his construction,
17 I don't get why they're doing this because the claim doesn't
18 say a first multiplication on a value, it says a first
19 operation on an input signal, which means you've got an input
11:07AM 20 signal coming in and a bunch of things can happen to that
21 signal before it's multiplied. That's exactly how it's
22 claimed.

23 And if you look at, for example, Fig. 4, and Fig. 4
24 is what the processor is. That's what the PE is and what it
25 does, and they just don't go to the multiplier for

1 willy-nilly execution. They do other stuff, and that's
2 exactly what he wants to change. He wants to say that
3 there's no input signal, that what it really is, a value.
4 The value skips right to the multiplier, and we don't do
5 that. That's what you're going to hear, but that's not how
6 it's written. I can say this forever, but if this isn't
7 trying to rewrite the claim, nothing is.

8 And then if we could go to the argument, locally
9 accessible, I don't think I have to spend much time on that.

11:08AM 10 We all know memory and locally accessible memory are
11 different. One is local, one isn't. One could be somewhere
12 that's not even in a room, and one could be right on the
13 chip, whatever, so, I mean, that's not even a "issue" that
14 they argue.

15 Then they argue this issue about the -- oh, it must
16 cover, what did they say, it must cover a software. It
17 doesn't cover software. This is a device, that's what it
18 says, a device having what? A processing element. That's a
19 thing.

11:08AM 20 The processing element having what? An input.
21 That's a thing. The processing element having an output.
22 That's a thing. And if you look at how you claim software,
23 you say emulate all of that. Nothing of that nature is in
24 there, so, I mean, that's just a few things.

25 And also one thing my Brother says, oh, we did

1 they delete input signal. That's gone. They delete that the
2 input signal is representative of anything, and they change
3 signal to value.

4 This, again, is the same claim that they
5 represented, which is an admission, to the patent office. It
6 needs no construction. Come on. You can't rewrite the
7 claim, and I think, Judge, that's about as easy to conclude
8 as follows:

9 Now, before I get into repeated execution, which is
11:11AM 10 the last thing, I would like to comment on a few of what my
11 Brother said. Also, if we could pull up slide 19 of theirs,
12 of Google's.

13 (A recess was taken.)

14 THE COURT: Mr. Hayes. And, again, if you need more
15 time, I'll give it to you.

16 MR. HAYES: Are we going to 12?

17 THE COURT: Again, I've got a call with about 1,000
18 people starting at 12, so how about 11:50?

19 MR. HAYES: Okay, I can do that. Anyways, claim 19,
11:17AM 20 my Brother puts that up as an analog signal. That's not an
21 analog. They withdrew that. If you look at the patent and
22 specifically column 14, lines 58 to I believe 60, 59 and 60,
23 they're talking about an analog, typical analog signal itself
24 modulates and then comes to stability over time period before
25 it's even, before you even start going in and taking the

1 statistical mean thereof.

2 It doesn't vary like this. If it varied like that
3 and that thing to the right was a TV, nothing would work,
4 your phone wouldn't work, nothing would work. If you look at
5 the column 14, yeah, I bring it up now, but 59 and 60,
6 they're talking about the variants of the signal
7 approximately 1 percent. That's hardly 1 percent. That's
8 just makeup to extend it.

9 Next my Brother uses -- you can take that off. Next
10 my Brother uses -- you can take that off. Next, my Brother
11 uses a slide, we'll just say, oh, this is heat. Who cares?
12 If it's hot, you left your phone out for two days and it
13 doesn't work, so what? We're talking about workable signals,
14 et cetera, and so, I mean, that has nothing to do with the
15 price of bread.

16 Let me see what else. If we look at slide 29, if
17 you look at slide 29, they spend some time on that saying,
18 oh, our expert confessed to something to that effect about
19 fluctuation. That's cropped, Judge. Both of those two
11:19AM 20 portions of the declaration are cropped.

21 In fact, if you read the next sentence on 33, it
22 either goes along, it explains how it comes down to a stable
23 situation that anybody who took second year calculus with a
24 little statistics can figure out. The same thing here on the
25 bottom line, 34, that's grossly cropped. The "... " is

1 exactly opposite what they cited it for, and I point that out
2 just simply because, you know, this is a consistent way, I
3 can't go through every single thing that they cropped, but I
4 think a few uncrops, a few cropped will sort of make my
5 point.

6 Then someone said that, oh, there's no support in
7 the spec. for the law of large numbers. Of course, there is.
8 It says the idea is they get a statistical mean. A
9 statistical mean by definition in a situation such as this
10 where they are doing one billion executions a second is a
11 statistical. I mean, the law of large numbers is exactly how
12 you do it.

13 THE COURT: But that's the question, right, I mean,
14 it gets back to repeated execution. Are we talking about a
15 billion or a trillion or are we talking two or three?

16 MR. HAYES: No, we're not talking about any number,
17 per se. You can't have a specific number. Why? Because all
18 of the systems are different, all of the perturbations are
19 different, and analog signals are going to have a different
20 analog signal. The idea, if you do repeated executions, as
21 we put in the declaration, pursuant to the law of large
22 numbers, which, indeed, then flattens out exactly at a
23 number, and that's exactly why if you look at the claim,
24 you're not comparing an exact number to a number, a result.
25 You're comparing to a statistical mean that is representative

1 that's unrebutted, unrebutted, period.

2 Next slide 26, same again, what a person of ordinary
3 skill in the art would understand. Same again, unrebutted
4 expert testimony as opposed to what do we have, attorney
5 argument on one side, and the notion that they couldn't have
6 submitted an expert report, sure, they could. All they had
7 to do is ask leave to do it.

8 But, in any event, the next one, the next slide,
9 this is, again, unrebutted, taking the average of a few
10 samples, well, I guess Lee thinks that's okay.

11:24AM

11 And, anyways, if we look at slide, 28 okay. Now we
12 get down to the nitty-gritty. The first thing that Google --
13 the reason their argument is technically erroneous is they
14 ignore the term "statistical mean." That's in the claim,
15 it's not arithmetic average.

16 One skilled in the art would not think they're going
17 to rely upon a number on that red box. Come on, do you know
18 how long it takes to get that graph run where you get a flat
19 statistical mean under the yellow box? That's less than one
20 millionth of one second, period, and on the left, it is
21 irrelevant. On the right is what one skilled in the art
22 figures out. That's exactly how it's claimed.

11:25AM

23 You don't have to know that it's Number 12023 and
24 put that in the claim. If that's the case maybe, what, one
25 human alive would have traced, so to speak. That's not how

1 going.

2 Secondly, the blue box is not incorrect, it says
3 repeat for all valid inputs, so that's a misstatement.

4 Third, when she keeps talking about Dr. Khatri and
5 our expert, your Honor, I just suggest that the clerk read
6 the quotes that she quotes because, believe it or not, 90
7 percent are indeed miscited.

8 Now, if you can give me the slide before that. Your
9 Honor, I really believe that one of ordinary skill in the art
11:40AM 10 would not, even Dr. Wei would not assume over there on the
11 far left red box where it's bouncing around like that is a
12 statistical mean of anything, and, frankly, if you look at
13 what he did there, his calculations probably don't even get
14 past the red line.

15 Don't forget, he did eight of them, and you can do
16 1500 one millionth of a second. I mean, I just think the
17 argument that was made, now, from a factual point of view,
18 his graph, as in the declaration of our expert, is exactly on
19 the exact parameters given by Dr. Wei. The only difference
11:41AM 20 is it complies with the law of large numbers and then
21 generates a statistical mean as such. That's it, Judge,
22 thank you.

23 THE COURT: All right. Thank you. We'll pause
24 there. I know that sometimes after a Markman Hearing, the
25 parties want to do follow-up, you know, supplemental

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C E R T I F I C A T E

UNITED STATES DISTRICT COURT)
DISTRICT OF MASSACHUSETTS) ss.
CITY OF BOSTON)

I do hereby certify that the foregoing transcript,
Pages 1 through 85 inclusive, was recorded by me
stenographically at the time and place aforesaid in Civil
Action No. 19-12551 -FDS, SINGULAR COMPUTING LLC vs. GOOGLE LLC
and thereafter by me reduced to typewriting and is a true and
accurate record of the proceedings.

Dated April 3, 2021.

s/s Valerie A. O'Hara

VALERIE A. O'HARA

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